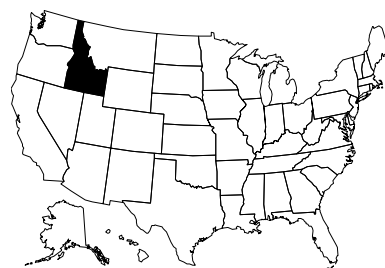


IDAHO

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Program Description

The Idaho surface water program uses biological information extensively to determine use support and impairment. In 1993, the Idaho Department of Environmental Quality (IDEQ) implemented a rapid bioassessment program aimed at integrating biological and chemical monitoring with physical habitat assessment as a way of characterizing water quality and stream integrity. This program, known as the Beneficial Use Reconnaissance Program (BURP), closely follows concepts and methods described in the *Rapid Bioassessment Protocols for Use in Streams and Rivers* (USEPA 1999). The main purpose of BURP is to provide consistency in monitoring, collecting data, and reporting. Specifically, biological along with physical, chemical, and landscape data are used to address the following objectives:

- Determine the degree of beneficial use support of the water body
- Determine the degree of biological integrity using biological information or other measures
- Compile descriptive information about the water body and data used in the assessment.

IDEQ has formal monitoring and assessment methods in place for large rivers and small streams. Methods for lakes and reservoirs are in development. For rivers and streams, there are a total of 8 multimetric indices for benthic macroinvertebrates, periphyton, fish, habitat, and physicochemical measures. Indices are integrated into attaining or non-attaining use support determinations. The integration uses a weight-of-evidence approach combined with individual minimum benchmarks for each assemblage and numeric criteria exceedances.

IDEQ has several plans to improve the current monitoring and assessment program. A draft statewide monitoring strategy will be introduced in July 2002. Future plans include incorporating a probabilistic monitoring design for screening purposes as well as adding methods for other water body types (e.g., wetlands, intermittent streams, springs, etc.). Implementation of these plans is dependent on agency priorities and available resources.

Documentation and Further Information

Idaho's 1998 303(d) List: http://www2.state.id.us/deg/water/1998_303d/303dlist.pdf

Grafe, C.S. et al. 2002. *Water body assessment guidance, 2nd edition*. Idaho Department of Environmental Quality. Boise, Idaho. 113 pp. http://www2.state.id.us/deg/water/surface_water/wbag/WBAG2001.htm

Grafe, C.S. (editor) April 2002. *Idaho small stream ecological assessment framework: an integrated approach*. Idaho Department of Environmental Quality. Boise, Idaho. 304 pp.
http://www2.state.id.us/deg/water/surface_water/wbag/WBAG_AssessmentFramework.htm

Grafe, C.S. (editor). April 2002. *Idaho river ecological assessment framework: an integrated approach*. Idaho Department of Environmental Quality. Boise, Idaho. 222 pp.
http://www2.state.id.us/deg/water/surface_water/wbag/WBAG_AssessmentFramework.htm

Beneficial Use Reconnaissance Program (BURP) 2001 Annual Work Plan for Wadeable (Small) Streams, 2001:
http://www2.state.id.us/deg/water/surface_water/2001_BURP_annual_work_plan_wadeable_streams.pdf

BURP Quality Assurance Plan for Field Data Sheets on Wadeable (Small) Streams, 2001:
http://www2.state.id.us/deg/water/surface_water/BURP_QualityAssurancePlan.pdf

1999 BURP Workplan for Wadeable Streams (Methods Manual):
http://www2.state.id.us/deg/water/surface_water/99_BURP_WORKPLAN.pdf

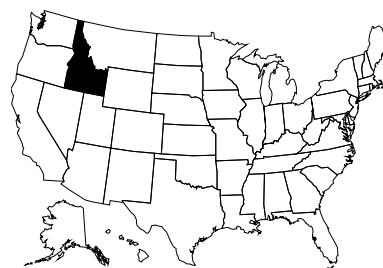
Streams: 1999 Post-Field Evaluation Summary Report (BURP), 2001:
http://www2.state.id.us/deg/water/surface_water/BURP_streams_Field_Report_99.pdf

Public Involvement and Response to Comment Summary: http://www2.state.id.us/deg/water/surface_water/wbag/WBAG2001.htm

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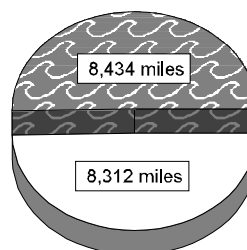
Programmatic Elements

Uses of bioassessment within overall water quality program	<input checked="" type="checkbox"/>	problem identification (screening)
	<input checked="" type="checkbox"/>	nonpoint source assessments
	<input checked="" type="checkbox"/>	monitoring the effectiveness of BMPs
	<input checked="" type="checkbox"/>	ALU determinations/ambient monitoring
	<input checked="" type="checkbox"/>	promulgated into state water quality standards as biocriteria
	<input type="checkbox"/>	support of antidegradation
	<input type="checkbox"/>	evaluation of discharge permit conditions
	<input checked="" type="checkbox"/>	TMDL assessment and monitoring
	<input type="checkbox"/>	other:
Applicable monitoring designs	<input checked="" type="checkbox"/>	targeted (i.e., sites selected for specific purpose) (<i>special projects, specific river basins or watersheds, and comprehensive use throughout jurisdiction</i>)
	<input checked="" type="checkbox"/>	fixed station (i.e., water quality monitoring stations) (<i>special projects only</i>)
	<input type="checkbox"/>	probabilistic by stream order/catchment area
	<input type="checkbox"/>	probabilistic by ecoregion, or statewide
	<input type="checkbox"/>	rotating basin
	<input type="checkbox"/>	other:

Stream Miles

Total miles	96,200
<i>(determined using the National Hydrography Database)</i>	
Total perennial miles	49,500
Total miles assessed for biology	16,742
fully supporting for 305(b)	8,434
partially/non-supporting for 305(b)	8,312
listed for 303(d)	8,312
number of sites sampled	4,500
number of miles assessed per site	~3.5

16,742 Miles Assessed for Biology



- ☒ "fully supporting" for 305(b)
- ☐ "partially/non-supporting" for 305(b)

Aquatic Life Use (ALU) Designations and Decision-Making

ALU designation basis	Warm Water vs. Cold Water	
ALU designations in state water quality standards	Sub-categories are cold water, seasonal cold water, warm water, modified (UAA required), and salmonid spawning.	
Narrative Biocriteria in WQS	<p>IDEQ's "Waterbody Assessment Guidance" and supporting technical reports are used to interpret and implement WQS, including ALU assessment. Although the term "biocriteria" is not used, functional elements are included in the WQS and in implementing ALU designation and support status guidance. Please see:</p> <p>http://www2.state.id.us/adm/adminrules/rules/IDAPA58/58INDEX.HTM</p>	
Numeric Biocriteria in WQS	none	
Uses of bioassessment data in integrated assessments with other environmental data (e.g., toxicity testing and chemical specific criteria)	<input checked="" type="checkbox"/>	assessment of aquatic resources
	<input checked="" type="checkbox"/>	cause and effect determinations
	<input checked="" type="checkbox"/>	permitted discharges
	<input checked="" type="checkbox"/>	monitoring (e.g., improvements after mitigation)
	<input checked="" type="checkbox"/>	watershed based management
Uses of bioassessment/biocriteria in making management decisions regarding restoration of aquatic resources to a designated ALU	<p>Used as restoration criteria in CERCLA cleanup monitoring effectiveness plans/consent decrees; bioassessment is required prior to removing 303(d) listed waters</p> <p>Most TMDLs have ALUS biomonitoring as part of implementation; one recent example is the North Fork of the Coeur d'Alene River.</p>	

Reference Site/Condition Development

Number of reference sites	200 total	
Reference site determinations	<input type="checkbox"/>	site-specific
	<input type="checkbox"/>	paired watersheds
	<input checked="" type="checkbox"/>	regional (aggregate of sites)
	<input checked="" type="checkbox"/>	professional judgment
	<input type="checkbox"/>	other:
Reference site criteria	Reference site criteria based on nearby road condition, riparian vegetation complexity, channel morphology and complexity, habitat structure complexity, evidence of chemical stressors, substrate heterogeneity, and evidence of point and nonpoint sources. Also, land satellite images are reviewed for evidence of disturbance in the watershed (see IDAPA 58.01.02.003.85).	
Characterization of reference sites within a regional context	<input type="checkbox"/>	historical conditions
	<input checked="" type="checkbox"/>	least disturbed sites
	<input type="checkbox"/>	gradient response
	<input checked="" type="checkbox"/>	professional judgment
	<input checked="" type="checkbox"/>	other: mostly least disturbed sites, but also minimally disturbed sites in some bioregions
Stream stratification within regional reference conditions	<input type="checkbox"/>	ecoregions (or some aggregate)
	<input type="checkbox"/>	elevation
	<input type="checkbox"/>	stream type
	<input type="checkbox"/>	multivariate grouping
	<input type="checkbox"/>	jurisdictional (i.e., statewide)
	<input checked="" type="checkbox"/>	other: bioregions based on groupings of ecoregions. Some of the indices classify by elevation and stream type.
Additional information	<input checked="" type="checkbox"/>	reference sites linked to ALU
	<input type="checkbox"/>	reference sites/condition referenced in water quality standards
	<input checked="" type="checkbox"/>	some reference sites represent acceptable human-induced conditions

Field and Lab Methods

Assemblages assessed	<input checked="" type="checkbox"/>	benthos (100-500 samples/year; single season, multiple sites - broad coverage)
	<input checked="" type="checkbox"/>	fish (100-500 samples/year; single season, multiple sites - broad coverage)
	<input checked="" type="checkbox"/>	periphyton (100-500 samples/year; single season, multiple sites - broad coverage)
	<input type="checkbox"/>	other:
Benthos		
sampling gear		Surber, Hess, Slack (0.5 meter, in rivers only); 500-600 micron mesh
habitat selection		richest habitat
subsample size		500 count
taxonomy		species
Fish		
sampling gear		backpack electrofisher
habitat selection		multihabitat
sample processing		length measurement, biomass - individual, biomass - batch and anomalies
subsample		none; full sample work-up
taxonomy		species (count and keep voucher specimens for species that are not identified in the field)
Periphyton		
sampling gear		natural substrate: brushing/scraping device (razor, toothbrush, etc.)
habitat selection		selected near macroinvertebrate sample
sample processing		taxonomic identification
taxonomy		species level
Habitat assessments		visual based, canopy closure (densiometer), Wolman pebble count, pool complexity (width, depth), stream width/depth, large woody debris; performed with bioassessments
Quality assurance program elements		standard operating procedures, quality assurance plan, periodic meetings and training for biologists, sorting and taxonomic proficiency checks, specimen archival

Data Analysis and Interpretation*

Data analysis tools and methods	<input checked="" type="checkbox"/>	summary tables, illustrative graphs
	<input checked="" type="checkbox"/>	parametric ANOVAs
	<input checked="" type="checkbox"/>	multivariate analysis
	<input checked="" type="checkbox"/>	biological metrics (<i>aggregate metrics into an index</i>)
	<input checked="" type="checkbox"/>	disturbance gradients
	<input type="checkbox"/>	other:
Multimetric thresholds		
transforming metrics into unitless scores		Varies by index - a combination of 95 th percentile of reference and cumulative distribution function used to scale metrics scores is most frequently used.
defining impairment in a multimetric index		25 th percentile of reference population**
Evaluation of performance characteristics	<input checked="" type="checkbox"/>	repeat sampling
	<input checked="" type="checkbox"/>	precision (<i>variability study of reference conditions</i>)
	<input checked="" type="checkbox"/>	sensitivity
	<input checked="" type="checkbox"/>	bias
	<input checked="" type="checkbox"/>	accuracy
Biological data		
Storage		MS Access, changing to Oracle/Visual Basic indexed to NHD
Retrieval and analysis		Custom interface (Biological Assessment Tool) developed to calculate metrics, indices, and physical and biological summary statistics. Systat is also used.

*Formal methods have been developed for non-wadeable rivers and wadeable streams. Lentic methods are under development. A total of eight multimetric indices for bugs, diatoms, fish, habitat, and physicochemical measures have been developed or adapted for rivers and streams. Indices are integrated into attaining or non-attaining use support determinations.

**Idaho uses a measure of CONDITION, which aggregates 3 different indices - Habitat, Benthos and Fish. Each index is compared to the median of reference condition and is given a score of 1, 2 or 3. All three scores are then combined (averaged). If > or = 2, then fully supporting; if <2, then not supporting.